

WHAT IS CLAIMED IS:

1. A system for issuing an authentication certificate used in personal authentication, comprising:

5 reaction means for reacting a DNA array having a known probe layout with DNA of a given person; and

issuing means for issuing an authentication certificate where there is a pattern of hybridized probes obtained by said reaction means for the  
10 authentication certificate.

2. The system according to claim 1, wherein said issuing means issues the authentication certificate by attaching the reacted DNA array obtained by said reaction means to the base.

15 3. The system according to claim 1, wherein said issuing means issues the authentication certificate on which layout information that expresses positions of hybridized probes using numerical values is recorded.

4. The system according to claim 3, wherein the  
20 layout information is magnetically recorded.

5. The system according to claim 3, wherein the layout information is recorded in the form of digital information.

6. The system according to claim 3, wherein the DNA  
25 array is formed by arranging a plurality of probes in row and column directions, and

the layout information expresses the positions of the hybridized probes on the DNA array using row and column addresses.

7. The system according to claim 1, wherein DNA  
5 probes of the DNA array comprise gene probes associated with major histocompatibility complex antigens.

8. The system according to claim 1, wherein DNA  
probes of the DNA array comprise gene probes associated with major histocompatibility complex antigens and  
10 single nucleotide polymorphisms.

9. The system according to claim 1, further comprising extraction means for extracting DNA from a blood sample, and providing the DNA to said reaction means.

15 10. The system according to claim 1, wherein a substrate on which the base and the DNA array are integrally formed is used.

11. A method for issuing an authentication certificate used in personal authentication,  
20 comprising:

the reaction step of reacting a DNA array having a known probe layout with DNA of a given person; and

the issuing step of issuing an authentication certificate where there is a pattern of hybridized  
25 probes obtained in the reaction step for the authentication certificate.



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19. The method according to claim 11, further comprising the extraction step of extracting DNA from a blood sample, and providing the DNA to the reaction step.
- 5 20. The method according to claim 11, wherein a substrate on which the base and the DNA array are integrally formed is used.
21. An apparatus for issuing an authentication certificate used in personal authentication,
- 10 comprising:
- reaction means for reacting a DNA array having a known probe layout with DNA of a given person; and
- issuing means for issuing an authentication certificate where there is a pattern of hybridized
- 15 probes obtained by said reaction means to a base for the authentication certificate.
22. The apparatus according to claim 21, wherein said issuing means issues the authentication certificate by attaching the reacted DNA array obtained by said
- 20 reaction means to the base.
23. The apparatus according to claim 21, wherein said issuing means issues the authentication certificate on which layout information that expresses positions of hybridized probes using numerical values is recorded.
- 25 24. The apparatus according to claim 21, further comprising extraction means for extracting DNA from a

blood sample, and providing the DNA to said reaction means.

25. An authentication system for personal authentication, comprising:

5 storage means for storing registration information which includes layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person;

10 acquisition means for acquiring the layout information from an authentication certificate;

generation means for generating authentication information on the basis of the layout information acquired by said acquisition means; and

15 authentication means for making authentication by collating the authentication information generated by said generation means with the registration information stored in said storage means.

20 26. The system according to claim 25, wherein the registration information and authentication information contain the layout information and type information used to specify a probe layout on the DNA array.

25 27. The system according to claim 25, wherein the layout information includes data that represent positions of the hybridized probes on the DNA array by coordinate values.

28. The system according to claim 25, wherein the authentication certificate includes a reacted DNA array on which a reaction pattern is formed upon reaction with a DNA of a given person, and

5           said acquisition means comprises a scanner for  
reading the hybridized pattern of the reacted DNA array  
as an image, and conversion means for detecting probes  
after reaction from the read image, and converting the  
detected probes into the layout information.

10     29.     The system according to claim 25, wherein the  
authentication certificate records the layout  
information as digital information, and

said acquisition means acquires the layout information by reading the digital information.

15 30. The system according to claim 25, wherein the authentication certificate records the layout information as magnetic information, and

said acquisition means acquires the layout information by reading the magnetic information.

20 31. The system according to claim 25, further comprising registration means for storing the authentication information generated by said generation means in said storage means as the registration information.

25 32. The system according to claim 25, wherein the DNA array comprises gene probes associated with major histocompatibility complex antigens.

33. The system according to claim 25, wherein the DNA array comprises gene probes associated with major histocompatibility complex antigens and single nucleotide polymorphisms.

5 34. The system according to claim 25, wherein the DNA array is formed by arranging a plurality of probes in row and column directions, and

the layout information expresses the positions of the hybridized probes on the DNA array using row and column addresses.

35. The system according to claim 25, wherein the authentication information and registration information contain person specifying information for specifying a given person, and

15 said authentication means makes authentication by searching said storage means for registration information which contains the same person specifying information as the person specifying information contained in the authentication information generated

20 by said generation means, and collating the layout information of the generated authentication information and the registration information found by search.

36. The system according to claim 25, wherein an apparatus having said acquisition means and said

25 generation means, and an apparatus having said storage means and said authentication means are connected via

the Internet, and the authentication information is sent via the Internet.

37. An apparatus for sending an authentication request to an external apparatus, comprising:

- 5        acquisition means for acquiring layout information that represents a layout pattern of reaction probes obtained by reacting a DNA array on which a plurality of probes are arranged by reading an authentication certificate;
- 10       generation means for generating authentication information on the basis of the layout information acquired by said acquisition means;
- registration request means for sending the authentication information to the external apparatus to
- 15    request user registration; and
- authentication request means for sending the authentication information to the external apparatus to request authentication.

38. An apparatus for making user authentication in response to an authentication request from an external apparatus, comprising:

- 25       reception means for receiving authentication information which includes layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, and



instruction information indicating a registration request or authentication request;

registration means for, when the instruction information indicates the registration request, making  
5 user registration on the basis of the authentication information received by said reception means; and

authentication means for, when the instruction information indicates the authentication request, making user authentication on the basis of the  
10 authentication information received by said reception means, and registration contents registered by said registration means.

39. An authentication method for personal authentication using storage means for storing  
15 registration information which includes layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, comprising:

20 the acquisition step of acquiring the layout information from an authentication certificate;

the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step; and

25 the authentication step of making authentication by collating the authentication information generated

in the generation step with the registration  
information stored in said storage means.

40. The method according to claim 39, wherein the  
registration information and authentication information  
5 contain the layout information and type information  
used to specify a probe layout on the DNA array.

41. The method according to claim 39, wherein the  
layout information includes data that represent  
positions of the hybridized probes on the DNA array by  
10 coordinate values.

42. The method according to claim 39, wherein the  
authentication certificate includes a reacted DNA array  
on which a reaction pattern is formed upon reaction  
with a DNA of a given person, and

15 the acquisition step comprises the conversion  
step of detecting probes after reaction from an image  
read by a scanner for reading the reaction pattern of  
the reacted DNA array as an image, and converting the  
detected probes into the layout information.

20 43. The method according to claim 39, wherein the  
authentication certificate records the layout  
information as digital information, and

the acquisition step includes the step of  
acquiring the layout information by reading the digital  
25 information.



contain person specifying information for specifying a given person, and

the authentication step includes the step of making authentication by searching said storage means for registration information which contains the same person specifying information as the person specifying information contained in the authentication information generated in the generation step, and collating the layout information of the generated authentication information and the registration information found by search.

50. The method according to claim 39, wherein an apparatus having the acquisition step and the generation step, and an apparatus having said storage means and the authentication step are connected via the Internet, and the authentication information is sent via the Internet.

51. A method for sending an authentication request to an external apparatus, comprising:

the acquisition step of acquiring layout information that represents a layout pattern of reaction probes obtained by reacting a DNA array on which a plurality of probes are arranged by reading an authentication certificate;

the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step;

the registration request step of sending the authentication information to the external apparatus to request user registration; and

the authentication request step of sending the authentication information to the external apparatus to request authentication.

52. A method for making user authentication in response to an authentication request from an external apparatus, comprising:

the reception step of receiving authentication information which includes layout information that represents a layout pattern of reaction probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, and instruction information indicating a registration request or authentication request;

the registration step of making, when the instruction information indicates the registration request, user registration on the basis of the authentication information received in the reception step; and

the authentication step of making, when the instruction information indicates the authentication request, user authentication on the basis of the authentication information received in the reception step, and registration contents registered in the registration step.

53. An authentication certificate used to  
authenticate a person, comprising:

a base; and

5 a holding portion for making said base hold  
information that represents a layout pattern of  
reaction probes obtained by reacting a DNA array having  
a known layout of a plurality of probes with DNA of the  
person.

54. The certificate according to claim 53, wherein  
10 said holding portion holds the information that  
represents the layout pattern of the reaction probes by  
attaching the reacted DNA array.

55. The certificate according to claim 53, wherein  
said holding portion holds the information that  
15 represents the layout pattern of the hybridized probes  
by one of magnetic recording and digital recording.

56. The certificate according to claim 55, wherein  
the DNA array is formed by arranging a plurality of  
probes in row and column directions, and  
20 the information that represents the layout  
pattern of the reaction probes contains position  
information which expresses positions of the hybridized  
probes on the DNA array by row and column addresses.

57. A computer readable medium which stores a control  
25 program for making a computer execute an authentication  
process for personal authentication using storage means  
for storing registration information which includes

layout information that represents a layout pattern of hybridized probes obtained by reacting a DNA array on which a plurality of probes are arranged with DNA of a given person, said control program comprising:

5           a code of the acquisition step of acquiring the layout information from an authentication certificate;

          a code of the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step; and

10           a code of the authentication step of making authentication by collating the authentication information generated in the generation step with the registration information stored in said storage means.

58.   A computer readable program which stores a  
15   control program for making a computer execute an authentication process for making authentication using an authentication certificate attached with a layout pattern of hybridized probes on a DNA array on which a plurality of probes are arranged, said control program  
20   comprising:

          a code of the acquisition step of acquiring layout information that represents the layout pattern of the hybridized probes by reading the authentication certificate;

25           a code of the generation step of generating authentication information on the basis of the layout information acquired in the acquisition step;

a code of the registration request step of  
sending the authentication information to the external  
apparatus to request user registration; and

a code of the authentication request step of  
5 sending the authentication information to the external  
apparatus to request authentication.

59. A computer readable medium which stores a control  
program for making a computer execute an authentication  
process for making authentication on the basis of  
10 layout information that represents a layout pattern of  
hybridized probes obtained by reacting a DNA array on  
which a plurality of probes are arranged with DNA of a  
given person, said control program comprising:

a code of the input step of inputting  
15 authentication information containing the layout  
information, and instruction information indicating a  
registration request or authentication request;

a code of the registration step of making, when  
the instruction information indicates the registration  
20 request, user registration on the basis of the  
authentication information received in the reception  
step; and

a code of the authentication step of making, when  
the instruction information indicates the  
25 authentication request, user authentication on the  
basis of the authentication information received in the



reception step, and registration contents registered in  
the registration step.

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